Data Metrics on NSF-supported International Engagement

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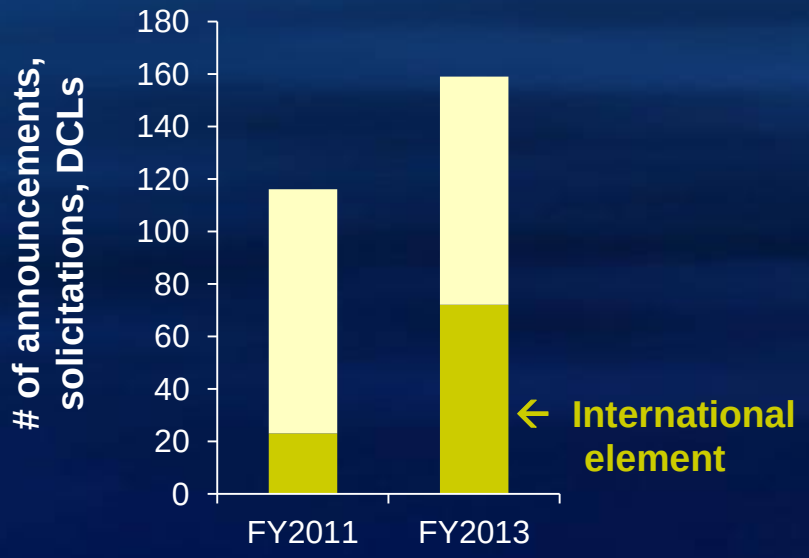
Why assess international engagement?

NSF Strategic Plan for FY 2011-2016

- **"Keep the United States globally competitive at the frontiers of knowledge by increasing international partnerships and collaborations" (Goal T-3)**

How does NSF assess this?

- **Increase the proportion of proposal-generating documents that invite US researchers to include an international element**



What are the limitations?

- **Manual**
- **Subjective**
- **No geographical information**
- **Elicit *proposals*? *awards*?**

Where can we find this information?

FastLane

Cover sheet
"International Cooperative Activities"
Countries involved

Proposal budget
Domestic (including Canada, Mexico)
Foreign

Proposal narratives
Title
Project summary
Budget summary

Research.gov

EIS

SQL

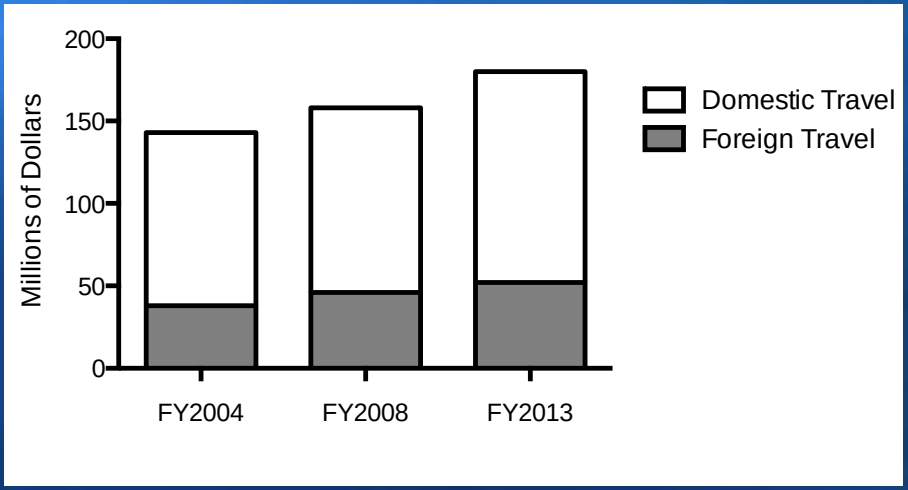
SOLR

eJacket

Staff-entered data
International Implications? Y/N
Country codes

Award narratives
Abstracts
Annual reports
Final reports

Example: Foreign Travel



How might this be interpreted?

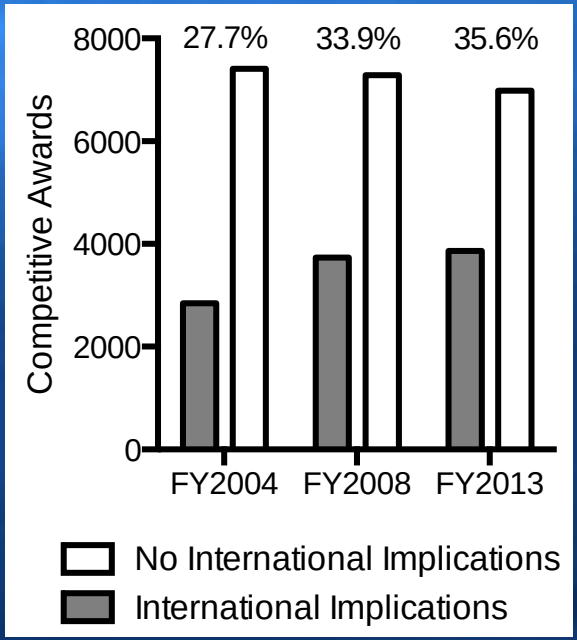
- NSF awards budgeted $51.8M in foreign travel in FY2013
- Foreign travel budgets increased 35% in the past decade, while domestic travel budgets only increased 23%

Are there limitations?

- EIS provides budget line items, not actual expenditures (+/- 10%)
- Domestic travel includes Canada, Mexico, US possessions
- Additional, confounding line item on proposal budget
- Includes travel to conferences, workshops, etc.

E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)		0
2. FOREIGN		8,000
F. PARTICIPANT SUPPORT COSTS		
1. STIPENDS	$ 0	
2. TRAVEL	0	
3. SUBSISTENCE	0	
4. OTHER	0	
(0) TOTAL PARTICIPANT COSTS		0

Example: International Implications

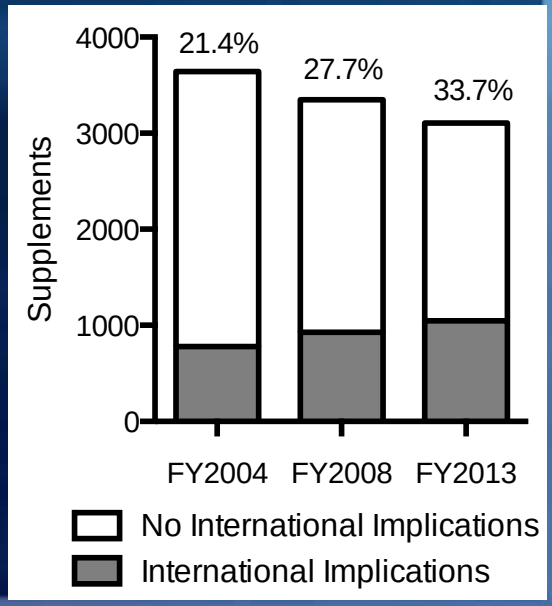


How might this be interpreted?

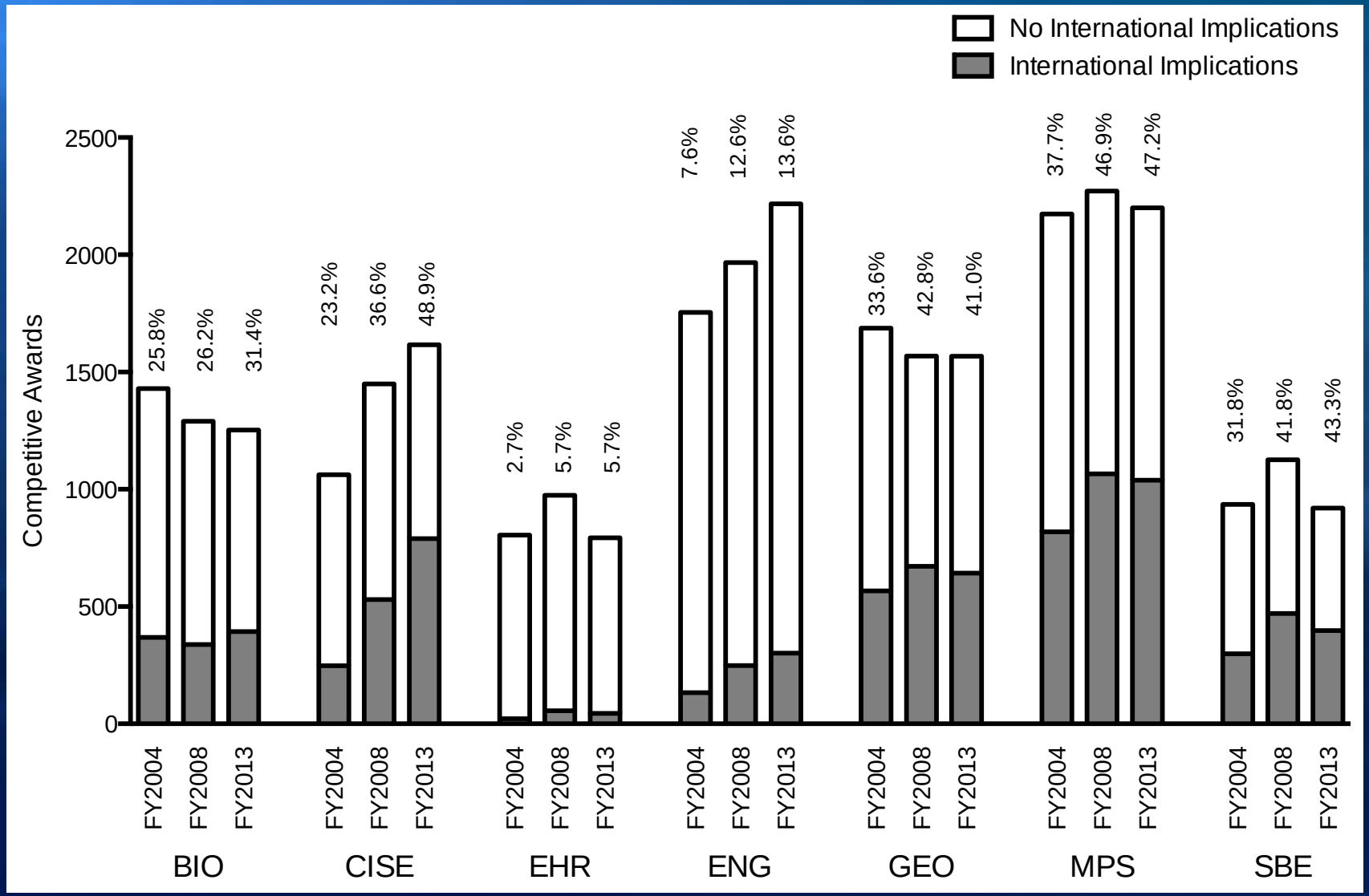
- The number and proportion of competitive awards with international implications have increased in the past decade

Are there limitations?

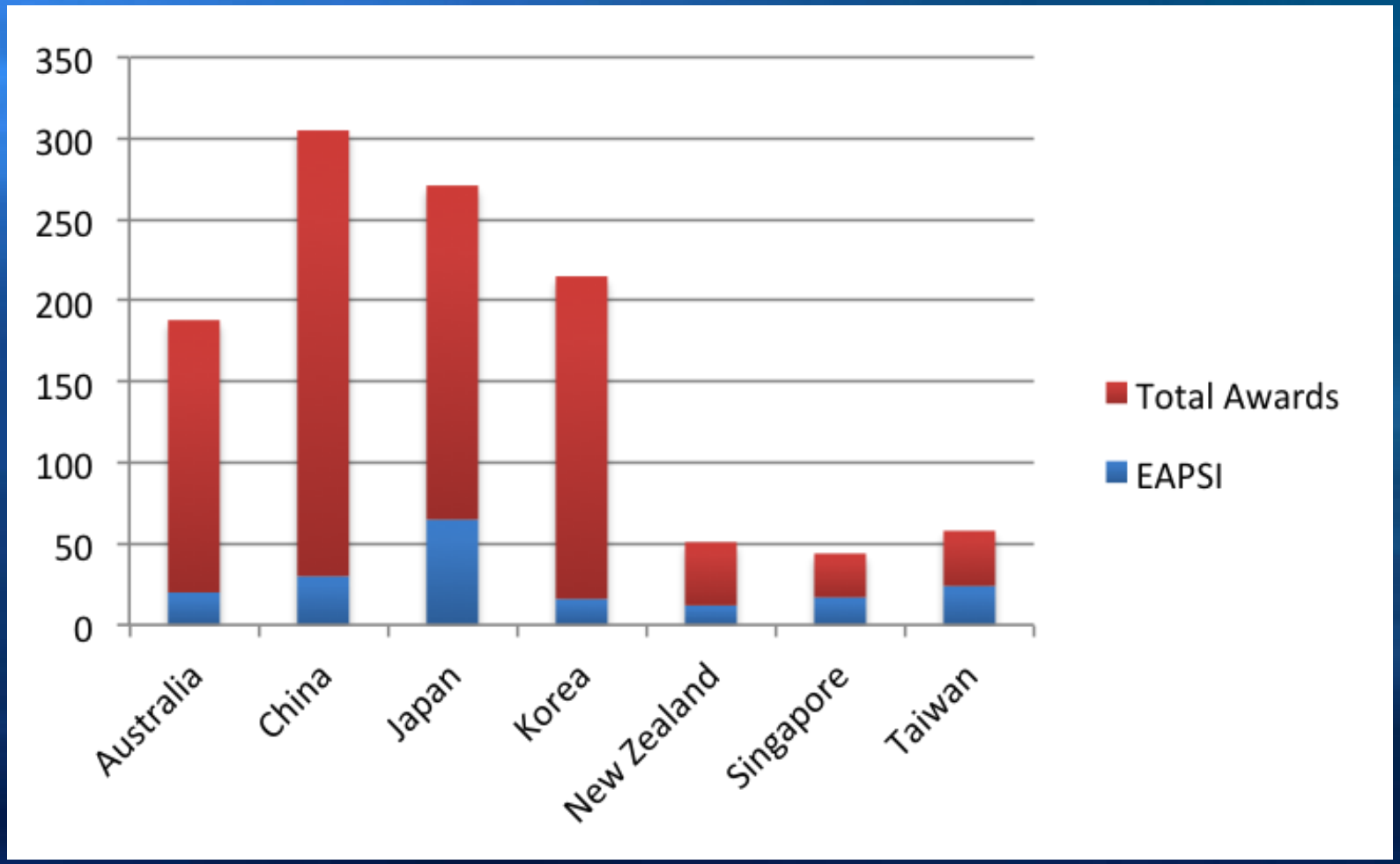
- Proposal data not reliable
- eJacket data entry not reliable
  - 2014: must check box if there is a foreign travel budget
  - Form clears after searching for country code
- Need simple, agreed upon definition for International Implications
- Major GPG revisions (2007, 2014) confound FY comparisons
- Does not capture international engagement added later
  - 25% listed US as country involved
  - Supplements
- Excludes non-competitive funding instruments (e.g., MREFC)



Example: International Implications

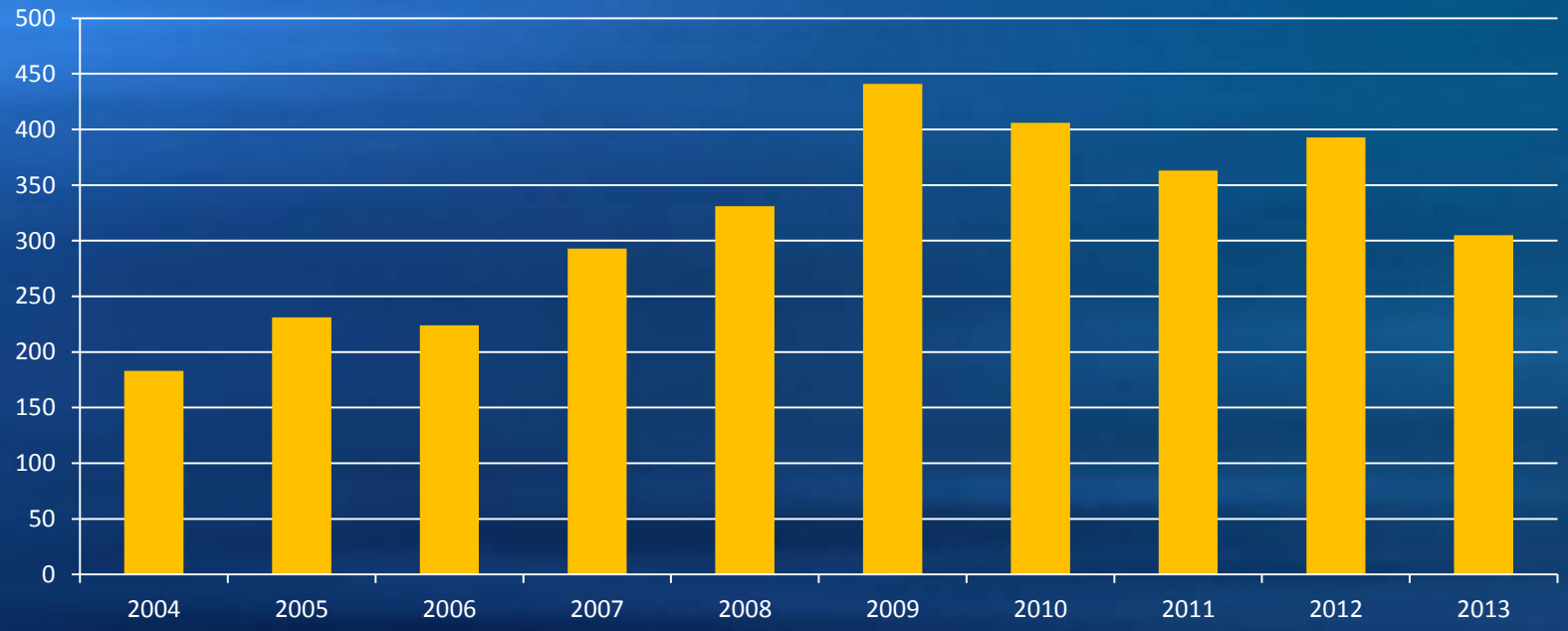


EAPSI constitutes 10% of CH-coded awards (FY13)

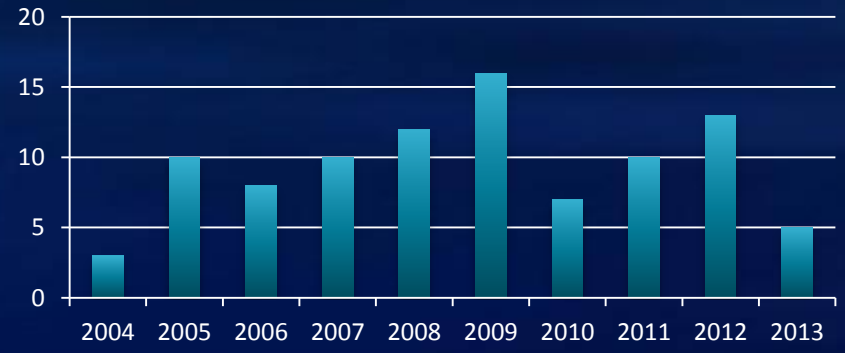


- eJacket country code: CH
- SQL report server

NSF awards coded with international cooperative activities with China



Workshops awarded and coded with China

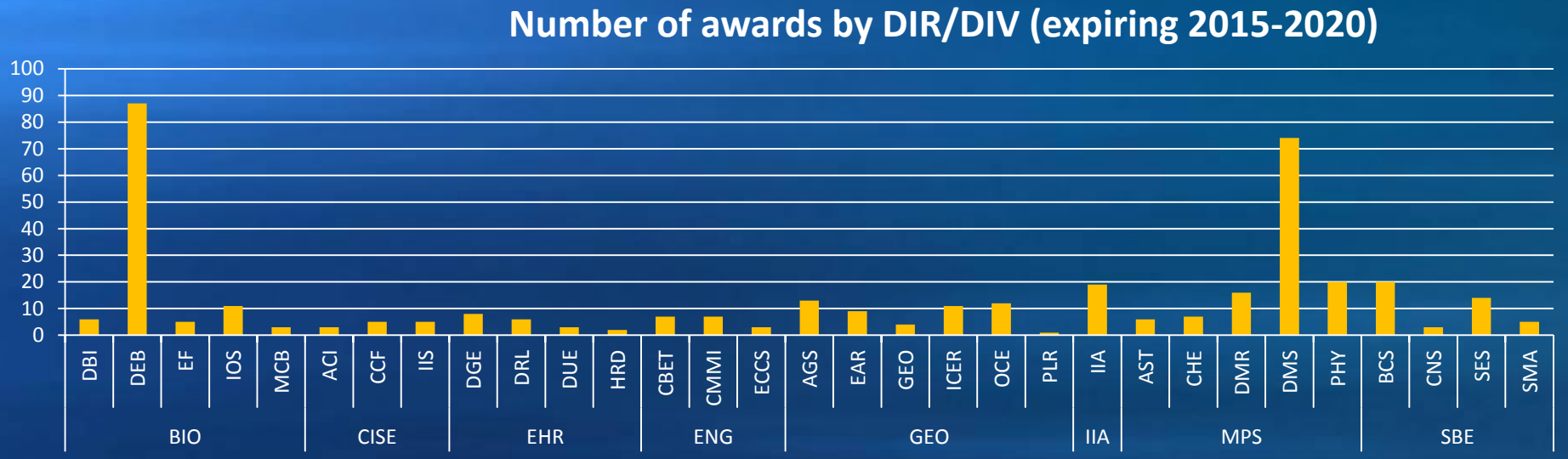


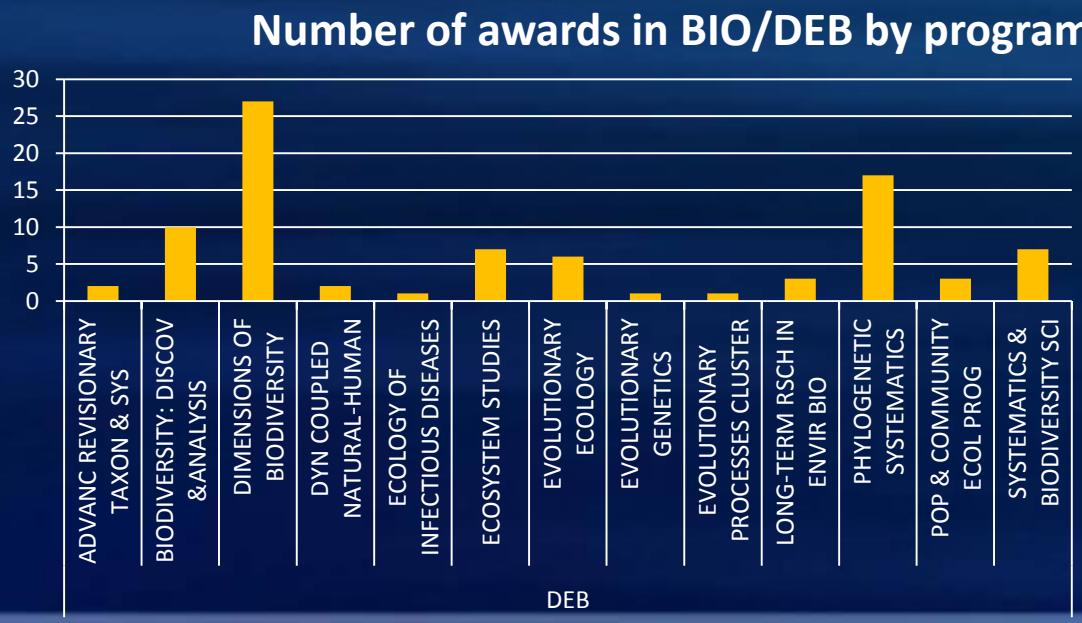
- eJacket country code: CH
- SQL report server

International Cooperative Activities (FY2013)
NSF & China & …

- Argentina (5)
- **Australia (14)**
- Austria (4)
- Antarctica
- Belgium (4)
- Burma
- Brazil (4)
- Bulgaria
- **Canada (20)**
- Chile (4)
- Colombia (2)
- Costa Rica
- Denmark (3)
- Ireland (2)
- Ethiopia
- Czech Republic (3)
- Finland
- **France (25)**
- **Germany (28)**
- Greece
- Hong Kong (4)
- Hungary
- Iceland
- India (9)
- Israel (3)
- Italy (9)
- **Japan (26)**
- Kenya
- Korea (5)
- Mongolia
- Mexico (6)
- Nigeria
- Netherlands (2)
- New Zealand (2)
- Poland
- Portugal
- Russia
- South Africa (2)
- Senegal
- Singapore (4)
- Spain (7)
- Sweden (3)
- Switzerland (3)
- Turkey
- Taiwan (4)
- **United Kingdom (12)**
- Vietnam (2)
- Namibia

Example: Brazil





Example: Text Mining

US-Brazil Collaboration

- Peptide nanostructure-based organic electronics
- Magnetic field effects in non-magnetic organic semiconductors
- Robot systems for large scale cooperative tasks
- Amphibian-killing fungus in Brazil
- Brazilian biofuels experience
- Ecology, energetics, and evolution comparison of the diet and behavior of tufted capuchins
- Intelligent maintenance strategies
- Floods and landslides in urbanized watersheds using advanced geospatial technologies
- Mathematical research experiences for students
- Network for advanced ceramics research

Query: international AND collaboration AND Brazil AND Section_Title:(summary NOT description) -- Source: NSF (100 results, 1203ms)

Next Steps

- **Create a working document** for the Foundation that clarifies distinctions between international 'engagement' and general international 'activity'
- **Assess current data sets and tools** available for data reporting and analysis
- **Identify constraints and potential enhancements** to existing data sets and reporting tools to include appropriate international indicators
- **Develop new tools and metrics** to address questions pertaining to international engagement supported by NSF
- **Identify potential clarifications** in NSF internal and external policy documents that guide internationally-relevant data inclusion and collection (e.g., GPG, PAM)
- **Assess NSF internal training needs** for PDs and administrative staff regarding reporting tools that include international implications

Questions to Address

- What are the trends within ***scientific disciplines*** with respect to NSF support for international engagement?
- How many awards include international engagement in a particular ***geographic location*** at the program, directorate, and/or Foundation scale;
  in what fiscal year; and for what amount?
- How much NSF funding is spent for ***international travel***?
- ***Who participated*** in international research collaborations (e.g., undergraduates, graduate students, postdoctoral scientists, early career scientists, senior personnel, principal investigators)?
- To what extent are ***proposal-generating documents*** effective in eliciting awards with international engagement?
- Is there a ***reviewer and/or institutional bias*** toward or against international engagement?
- To what extent do awards with ***proposed international implications*** reflect ***actual international engagement*** in final project reports?
- ***Others?***

Discussion

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